

Amendment

Serial No. 10/792,322

IN THE DRAWINGS

Please replace FIG. 9 with the new FIG. 9 contained in the replacement sheet

REMARKS

Claims 1-20 are pending in the application. Claims 1-20 stand rejected. Claim 21 is added. Claims 1, 6, and 16 are independent claims.

Claim 21 is added. The support can be found at page 6, line 17 – page 7, line 1; at page 8, line 9-11; and in FIG. 3 and 4.

Figure 9 stands objected as allegedly containing typographical errors. In response, the Applicant submits a replacement sheet containing a new FIG. 9.

The language of claim 7 is changed; but no additional feature is added to claim 7. As such, no new search is necessitated by the amendment.

Claim 1 stand rejected under 35 U.S.C §103(a) as allegedly being obvious over Lee *et al.* (U.S. Pub. 2003/0142978) (“Lee”) in view of Watanabe (U.S. 6,847,758).

Claim 1 recites a multi-wavelength optical transmitter comprising “a semiconductor optical amplifier (SOA) configured to amplify the optical signal in a gain saturation state and to **reduce a relative intensity of the noise channels of the optical signal**, said SOA being configured to **output the optical signal having the plurality of mode-locked channels**, the mode-locked channels having different wavelengths, **and the plurality of noise channels**, the noise channels having different wavelengths and **the reduced relative intensity**.”

The support can be found at page 6, line 17 – page 7, line 1; at page 8, line 9-11; and in FIG. 3 and 4

To reject a claim under section 103, the United States Court of Appeals for the Federal Circuit required a showing of **an un rebutted prima facie case of obviousness** (*In re Rouffet*, 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir. 1998)). According to the MPEP 2143.03, the *prima*

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facie case can be established only if one or more references cited by the Patent Office **teach all features** recited in the claim (see also MPEP 2143.03).

Moreover, in determining patentability of the claim, the Federal Circuit and the MPEP explicitly requires consideration of each of the claimed invention and the references, **as a whole** (MPEP 2141.02).

In the present Office Action, the Patent Office indicates that although Lee discloses a semiconductor optical amplifier (the “SOA”), **Lee fails to disclose an optical transmitter comprising a semiconductor optical amplifier (the “SOA”) that is configured to amplify the optical signal in a gain saturation state** (the present Office Action, page 3). The Patent Office, nevertheless, indicates that claim 1 is not patentable as Watanabe discloses a SOA that is configured to amplify the optical signal in a gain saturation state, and Watanabe, when combined with Lee, remedies the deficiencies of Lee (*id.*).

Lee, as acknowledged by the Patent Office, does not disclose an optical transmitter that an optical transmitter comprising a semiconductor optical amplifier (the “SOA”) that is configured to amplify the optical signal in a gain saturation state. Lee, instead, discloses an optical transmitter containing a pair of **SOAs** 507 and 508 that are **configured to compensate loss in the optical signal that occur during transmission** (FIG. 5; [0048] and [0049]).

As such, Lee, as a whole, fails to teach or render obvious the “a semiconductor optical amplifier (SOA) configured to amplify the optical signal in a gain saturation state and to **reduce a relative intensity of the noise channels of the optical signal**, said SOA being configured to **output the optical signal having the plurality of mode-locked channels**, the mode-locked channels having different wavelengths, **and the plurality of noise channels**, the noise channels having different wavelengths and **the reduced relative intensity**” of claim 1.

Watanabe, as read by the Applicant, discloses an optical device containing a gain-saturated optical amplifier 6 that is configured to input an optical signal containing a plurality of pulses, to suppress amplitude fluctuation contained near peak of each pulse, and output an optical signal having flattened peak (column 8, line 23-44). However, nowhere does Watanabe, as a whole, disclose or render obvious the SOA that is “configured to amplify the optical signal in a gain saturation state and to reduce a relative intensity of the noise channels of the optical signal, said SOA being configured to output the optical signal having the plurality of mode-locked channels, the mode-locked channels having different wavelengths, and the plurality of noise channels, the noise channels having different wavelengths and the reduced relative intensity,” as recited in claim 1.

As such, both Lee and Watanabe fail to teach or render obvious all features of claim 1, and the references, alone or in combination, do not render claim 1 obvious.

The Applicant respectfully requests withdrawal of the rejection on claim 1.

Claim 6 stands rejected under 35 U.S.C §103(a) as allegedly being obvious over Lee in view of Watanabe.

Claim 6 recites a bi-directional wavelength division multiplexing system comprising a central office, “wherein the central office includes: a semiconductor optical amplifier configured to amplify the upstream optical signal to be demultiplexed in a gain saturation state, [and] to amplify the downstream optical signal to be outputted by the central office in a gain saturation state.”

As noted above, Lee discloses an optical transmitter containing a pair of SOAs 507 and 508 that are configured to compensate loss in the optical signal that occur during transmission

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(FIG. 5; [0048] and [0049]). However, nowhere does Lee teach that any one of the SOAs 507 and 508 is configured to amplify the optical signal in gain saturation state.

Moreover, Lee explicitly teaches that the SOA 507 is configured to amplify only the upstream optical signal, whereas the SOA 508 is configured to amplify only the downstream optical signal (id.). In other words, Lee explicitly teaches that each of the SOAs 507 and 508 is configured to amplify one of upstream and downstream signals (id.)

As such, neither one of the disclosed SOAs of Lee (the '978 publication) is configured to amplify the upstream optical signal to be demultiplexed in a gain saturation state, [and] to amplify the downstream optical signal to be outputted by the central office in a gain saturation state," as does the SOA of claim 6.

Watanabe, as noted above, discloses an optical device containing a gain-saturated optical amplifier 6 to input an optical signal containing a plurality of pulses, to suppress amplitude fluctuation contained near peak of each pulse, and output an optical signal having flattened peak (column 8, line 23-44). However, nowhere in Watanabe is there a disclosure of an SOA that is configured "to amplify the upstream optical signal to be demultiplexed in a gain saturation state, [and] to amplify the downstream optical signal to be outputted by the central office in a gain saturation state," as does the SOA of claim 6.

Therefore, neither Lee nor Watanabe teaches a multi-wavelength optical transmitter comprising the semiconductor optical amplifier (SOA) of claim 6, and the references, alone or in combination, do not render claim 6 obvious.

The Applicant respectfully requests withdrawal of the rejection on claim 6.

Claim 16 stands rejected under 35 U.S.C §103(a) as allegedly being obvious over in view of Watanabe.

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Claim 16, a method claim, recites the features analogous to those described in claim 1 and discussed in the Applicant remark regarding patentability of claim 1. As such, the Applicant believes that claim 16 is patentable over Lee and Watanabe on the similar grounds.

The Applicant respectfully request withdrawal of the rejection on claim 16.


Other claims in this application are each dependent on the independent claims 1, 6, and 16, and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration of the patentability of each on its own merits is respectfully requested.

A check for \$50.00 is enclosed herein to cover one extra dependent claim.

Should the Examiner deem that there are any issues which may be best resolved by telephone, please contact Applicant's undersigned representative at the number listed below.

Respectfully submitted,

Date: February 21, 2007


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